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May 30, 2017

Via Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: *Written Ex Parte: TerreStar Corporation Request for Temporary Waiver of
Substantial Service Requirements* – WT Docket No. 16-290

Dear Ms. Dortch:

On May 24, 2017, TerreStar Corporation (“TerreStar”) filed comments in response to the Commission’s April 24, 2017 Public Notice on actions to accelerate adoption and accessibility of broadband-enabled health care solutions and advanced technologies.¹ In the *Health Care PN*, the Commission asked for comment on, among other things, issues related to wireless medical telemetry operations at health care facilities. The Commission also sought information about spectrum needs in the health care sector and the increased use and proliferation of wireless medical devices in health care environments. The Commission noted TerreStar’s above-captioned request for temporary waiver of its substantial service requirements, to enable TerreStar to use its 1.4 GHz spectrum for wireless medical telemetry operations.²

With this letter, TerreStar hereby submits its comments on the *Health Care PN* into the record of this waiver proceeding. In its filing, TerreStar commended the Commission for its efforts to promote health care quality and innovation through the use of communications technology, and pointed out that grant of TerreStar’s Waiver Request will advance the goals set forth in the *Health Care PN*. As demonstrated in the Waiver Request, grant of this temporary

¹ *FCC Seeks Comment on Data on Actions to Accelerate Adoption and Accessibility of Broadband-Enabled Health Care Solutions and Advanced Technologies*, Public Notice, GN Docket No. 16-46, FCC 17-46 (rel. Apr. 24, 2017) (“*Health Care PN*”); Comments of TerreStar Corporation, GN Docket No. 16-46 (May 24, 2017) (“*TerreStar Comments*”).

² *Health Care PN* at 13-14; TerreStar Corporation Request for Temporary Waiver of Substantial Service Requirements, WT Docket No. 16-290, ULS File Nos. 0007375830-0007375893 (Aug. 12, 2016) (“*Waiver Request*”); *Wireless Telecommunications Bureau Seeks Comment Regarding TerreStar Corporation’s Request for Relief of Certain 1.4 GHz Construction Requirements*, Public Notice, 31 FCC Rcd 9798 (2016).

waiver will enable TerreStar to generate important health care benefits for millions of patients in hospitals and other health care facilities across the nation. Because TerreStar's spectrum is adjacent to frequencies already dedicated to wireless medical telemetry, the Commission will seamlessly expand medical telemetry capacity at 1.4 GHz by approximately 67% with a grant of the Waiver Request. This increased capacity will permit TerreStar and equipment manufacturers to implement new, innovative telemetry applications. Grant of the Waiver Request will also help avoid spectrum congestion that will otherwise result as the U.S. patient population ages and the need for remote monitoring at hospitals becomes more intense. This action will enhance the reliability of life-critical medical telemetry transmissions and further the Commission's crucial health care objectives.

In their respective comments on the *Health Care PN*, both the American Society for Healthcare Engineering ("ASHE") of the American Hospital Association and GE Healthcare also reiterate their support for grant of the Waiver Request.³ TerreStar greatly appreciates the position taken by these parties, who have deep expertise on the medical telemetry ecosystem in the dedicated Wireless Medical Telemetry Service ("WMTS") bands. In their comments, both ASHE and GE Healthcare acknowledge the threat of spectrum congestion in the dedicated WMTS band at 1.4 GHz, and point to the severe harm that can result from interference to life-critical WMTS transmissions. ASHE states that it understands that "some areas with a concentration of health care facilities are experiencing WMTS saturation due to a lack of 1.4 GHz spectrum."⁴ GE Healthcare observes that "the number of healthcare facilities that rely on WMTS is expected to increase significantly as hospitals and others adapt to an aging U.S. patient population and increased patient acuties," and notes that "many have advised the Commission that additional spectrum will be needed to keep up with the growing demand for such services."⁵ With respect to harm from interference, ASHE points out that "for a WMTS system even a small level of interference could result in the failure of the WMTS system to monitor critical care patients for some period of time, placing those patients at significant health risk."⁶ Similarly, GE Healthcare states that "[a]s a safety-of-life service, WMTS cannot tolerate even small or episodic incidents of interference. For example, a single source of interference can cripple an entire WMTS system and be extremely difficult to identify, while endangering patients and diverting the attention of hospital staff."⁷

ASHE and GE Healthcare both support grant of TerreStar's Waiver Request as a means of addressing these WMTS interference concerns. ASHE states that it has previously "expressed

³ Comments of the American Society for Healthcare Engineering of the American Hospital Association, GN Docket No. 16-46 (May 24, 2017) ("ASHE Comments"); Comments of GE Healthcare, GN Docket No. 16-46 (May 24, 2017) ("GE Healthcare Comments").

⁴ ASHE Comments at 12.

⁵ GE Healthcare Comments at 3.

⁶ ASHE Comments at 5.

⁷ GE Healthcare Comments at 5.

its appreciation for TerreStar's recognition of the likely spectrum shortage facing WMTS licensees and of the substantial benefit that can be realized by making the 1390-1395 MHz and 1432-1435 MHz bands available for use in WMTS systems," and emphasizes that it "continues to support the requested relief."⁸ GE Healthcare argues that "[t]he Commission can help address the growing need for additional wireless medical telemetry spectrum by, among other things, granting TerreStar's request to use its licensed spectrum to support wireless medical telemetry operations in the 1390-1392, 1392-1395, and 1432-1435 MHz bands."⁹ GE Healthcare further points out that TerreStar cannot implement wireless medical telemetry in its spectrum without grant of the Waiver Request, since "[i]t could take up to three years for TerreStar, equipment manufacturers, and healthcare providers to develop, test, and deploy wireless medical telemetry systems that can viably operate on the spectrum."¹⁰

* * *

TerreStar has satisfied the Commission's criteria for a temporary substantial service waiver in the commercial 1.4 GHz band. Grant of the Waiver Request will yield the extraordinary public interest benefits described at length in this proceeding. Accordingly, TerreStar urges the Wireless Telecommunications Bureau to grant this request, with appropriate terms and conditions, in order to bring enormous health care benefits to millions of patients treated at hospitals and other health care facilities around the country.

Pursuant to section 1.1206(b)(2) of the Commission's rules, 47 C.F.R. § 1.1206(b)(2), this written *ex parte* and the attached TerreStar comments are being filed electronically for inclusion in the public record of the above-referenced proceeding.

Respectfully submitted,

/s/ Regina M. Keeney
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cc: James Schlichting
Roger Noel
Linda Chang
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⁸ ASHE Comments at 12, 13.

⁹ GE Healthcare Comments at 6. GE Healthcare notes that the addition of TerreStar's spectrum would "increase the capacity for such 1.4 GHz operations by approximately 67 percent," and that TerreStar's spectrum "is also well situated, as it is adjacent to two bands that are already used for WMTS." *Id.* GE Healthcare adds that "[t]he 1392-1395 MHz band could be used for innovative wireless medical telemetry applications outside healthcare facilities." *Id.* See also TerreStar Comments at 7, 9-10.

¹⁰ GE Healthcare Comments at 7.

**Before the
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In the Matter of)	
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Actions to Accelerate Adoption and)	GN Docket No. 16-46
Accessibility of Broadband-Enabled)	
Health Care Solutions and Advanced)	
Technologies)	

COMMENTS OF TERRESTAR CORPORATION

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May 24, 2017

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COMMENTS OF TERRESTAR CORPORATION

I. Introduction and Summary

TerreStar Corporation (“TerreStar”) hereby comments on the Commission’s April 24, 2017 Public Notice requesting comment on actions to accelerate adoption and accessibility of broadband-enabled health care solutions and advanced technologies.¹ TerreStar applauds the Commission for this and other efforts to promote health care quality and innovation through the use of communications technology. In the *Health Care PN*, the Commission asks for comment on, among other things, issues related to wireless medical telemetry operations at health care facilities. The Commission also seeks information about spectrum needs in the health care sector and the increased use and proliferation of wireless medical devices in health care environments.

In the *Health Care PN*, the Commission notes TerreStar’s pending request for temporary waiver of its substantial service requirements, to enable TerreStar to use its 1.4 GHz spectrum for wireless medical telemetry operations.² The Commission states further that TerreStar’s

¹ Public Notice, *FCC Seeks Comment on Data on Actions to Accelerate Adoption and Accessibility of Broadband-Enabled Health Care Solutions and Advanced Technologies*, GN Docket No. 16-46, FCC 17-46 (rel. Apr. 24, 2017) (“*Health Care PN*”).

² TerreStar Corporation Request for Temporary Waiver of Substantial Service Requirements, WT Docket No. 16-290, ULS File Nos. 0007375830-0007375893 (Aug. 12, 2016) (“Waiver Request”); *Wireless Telecommunications Bureau Seeks Comment Regarding*

Waiver Request is supported by a number of parties, including the American Society for Healthcare Engineering of the American Hospital Association (“ASHE”) and manufacturers of wireless medical telemetry service equipment.³

As demonstrated in the Waiver Request, grant of this temporary waiver will yield important health care benefits for millions of patients in hospitals and other health care facilities across the nation. Because TerreStar’s spectrum is adjacent to frequencies already dedicated to wireless medical telemetry, the Commission will seamlessly expand medical telemetry capacity at 1.4 GHz by approximately 67% with a grant of the Waiver Request. This increased capacity will permit TerreStar and equipment manufacturers to implement new, innovative telemetry applications. Significantly, grant of the Waiver Request will also help avoid spectrum congestion that will otherwise result as the U.S. patient population ages and the need for remote monitoring at hospitals becomes more intense. The Commission will enhance the reliability of life-critical medical telemetry transmissions and further its important health care goals by granting the Waiver Request.⁴

TerreStar Corporation’s Request for Relief of Certain 1.4 GHz Construction Requirements, Public Notice, 31 FCC Rcd 9798 (2016) (DA 16-1029).

³ *Health Care PN* at 13-14 & nn.51-52.

⁴ Chairman Ajit Pai has made clear his commitment to spectrum-related actions that “enable[e] significant, positive impacts on Americans’ health and on overall health care costs.” *Amendment of the Commission’s Rules to Provide Spectrum for the Operation of Medical Body Area Networks*, First Report and Order and Further Notice of Proposed Rulemaking, 27 FCC Rcd 6422, 6488 (Separate Statement of Commissioner Ajit V. Pai) (2012). Commissioner Mignon Clyburn has also emphasized the health care benefits of communications technology. See Keynote Remarks of Commissioner Mignon L. Clyburn, Cleveland Clinic’s 2015 Medical Innovation Summit, at 1 (Oct. 26, 2015), <https://www.fcc.gov/document/commissioner-clyburn-keynote-remarks-2015-medical-innovation-summit> (“[T]he real power of connectivity is what it enables in health. . . . [T]his is also about the individual, the consumer, the patient, *not* just the connections, the devices or the apps. It is about how technology is meeting the needs and improving the lives of people.”).

II. The Health Care Benefits of Wireless Medical Telemetry

The Commission's attention in the *Health Care PN* to wireless medical telemetry operations is warranted.⁵ This radio frequency ("RF")-enabled technology has transformed the health care industry. Hospitals and other health care providers can now monitor, remotely and in real-time, their patients' vital signs such as heart and respiration rates, oxygen saturation, and other important health parameters. Chairman Pai has noted that "[h]ospitals use [wireless medical telemetry] for a variety of critical functions, from tracking the vital signs of patients undergoing cardiac rehab to monitoring emergency room trauma and fetal activity."⁶ With wireless medical telemetry, nurses at a nurses' station can detect promptly potentially life-threatening conditions (*e.g.*, cardiac arrhythmias and apneas), and respond more rapidly to changes in their patients' conditions. In addition, the untethered nature of wireless medical telemetry provides patients with greater mobility, freedom, comfort, and safety, including by lowering the risk of patient falls due to tripping hazards attributed to wired equipment. In many cases, patients' increased mobility results in a more rapid recovery.

The development of wireless medical telemetry over the past thirty years has generated important medical benefits, substantially improving health care providers' standard of care and the quality of patients' experiences and outcomes. The health care industry has invested billions of dollars developing and deploying wireless medical telemetry systems, and these systems are now an essential element of the health care ecosystem. Health care providers are using wireless

⁵ *Health Care PN* at 13-14.

⁶ *Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, et al.*, Report and Order, 30 FCC Rcd 9551, 9733-34 (Statement of Commissioner Ajit Pai) (2015) ("*600 MHz Order*").

medical telemetry equipment in an expanding variety of health care settings, including in formerly “non-monitored” areas such as surgical facilities and general wards.

To facilitate the development of wireless medical telemetry, the Commission established the dedicated 1.4 GHz Wireless Medical Telemetry Service (“WMTS”) band, consisting of a five megahertz band segment at 1395-1400 MHz and a varying two and a half megahertz band segment within the 1427-1431.5 MHz band.⁷ Even with this allocation, the rapid growth of wireless medical telemetry has raised concerns regarding a shortage of spectrum for this critical safety-of-life service, as the *Health Care PN* acknowledges.⁸ Increasingly dense medical telemetry deployments in large and busy hospitals can lead to spectrum exhaustion in these health care environments, jeopardizing the reliability and security of wireless medical telemetry transmissions. As Chairman Pai has pointed out, in this health care setting “[h]armful interference could have serious and immediate consequences,” since “WMTS can involve matters of life and death.”⁹ As discussed below, authorizing TerreStar to use its commercial 1.4 GHz spectrum for wireless

⁷ See *Amendment of Parts 2 and 95 of the Commission’s Rules to Create a Wireless Medical Telemetry Service*, Report and Order, 15 FCC Rcd 11206 (2000); *Amendments to Parts 1, 2, 27 and 90 of the Commission’s Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, Report and Order, 17 FCC Rcd 9980 (2002); see also 47 C.F.R. §§ 95.1101, *et seq.* The Commission also adopted service rules for WMTS in Part 95. Under these rules, only eligible health care providers within a health care facility are permitted to operate WMTS devices. Rather than issue individual, exclusive WMTS licenses, the Commission licenses this WMTS band “by rule.” Under this regulatory approach, any health care provider who wishes to operate WMTS equipment at a given location must first register and provide the requisite information (such as location and frequency of operation) to a database administrator.

⁸ *Health Care PN* at 13-14.

⁹ *600 MHz Order* at 9733. Commissioner Michael O’Rielly has stated that he appreciates Chairman Pai’s efforts “to ensure that hospitals that rely on this spectrum for such devices as heart and fetal monitors, something I have learned more about lately, can avoid harmful interference.” *Id.* at 9736 (Statement of Commissioner Michael O’Rielly).

medical telemetry will help resolve these interference concerns and yield extraordinary benefits for the health care community and millions of patients around the United States.

III. TerreStar and Its Commercial Wireless Spectrum at 1.4 GHz

TerreStar is the sole, nationwide licensee in the commercial wireless 1.4 GHz band at 1390-1395 MHz and 1432-1435 MHz, immediately adjacent to the dedicated WMTS bands at 1.4 GHz.¹⁰ In early 2014, TerreStar had begun executing plans for the widespread deployment of a high-power 802.16 WiMAX network for smart grid applications on its licensed spectrum.¹¹ In discussions during 2014, however, representatives of ASHE, equipment manufacturers Philips Healthcare and GE Healthcare, and frequency coordinator Comsearch voiced serious concerns that, although a high-power 802.16 WiMAX network might be permitted under existing Part 27 rules, out of band emissions from a 1.4 GHz WiMAX network would threaten substantial interference to life-critical wireless medical telemetry applications in the adjacent WMTS bands. This potential for interference was confirmed by field and laboratory tests conducted in 2014 by TerreStar's technical consultant.

After additional consultations with Philips Healthcare and GE Healthcare and several meetings with Commission staff during 2014-2016, TerreStar decided to move forward with a

¹⁰ TerreStar holds six Economic Area Grouping ("EAG") licenses in the 1.4 GHz A Block (1392-1393.5 MHz/1432-1433.5 MHz), six EAG licenses in the 1.4 GHz B Block (1393.5-1395 MHz/1433.5-1435 MHz), and fifty-two Major Economic Area ("MEA") licenses in the unpaired 1390-1392 MHz band.

¹¹ The market potential of a smart grid WiMAX network was demonstrated by TerreStar's May 2012 spectrum lease arrangement with FirstEnergy Service Company ("FirstEnergy"), a large electrical utility. This lease agreement permitted FirstEnergy to deploy high-power 802.16 WiMAX facilities for smart grid applications in two EAG license areas in the 1.4 GHz A and B Blocks. FirstEnergy's Smart Grid Modernization Initiative project included deployment of advanced metering infrastructure, distribution automation assets, time-based rate programs, load control, and customer systems in New Jersey, Ohio, and Pennsylvania. TerreStar's 1.4 GHz spectrum was a critical part of the communications infrastructure for this project, enabling data to be wirelessly transmitted between smart grid systems and pole-mounted concentrators.

different business plan at 1.4 GHz. Given (i) the adjacency of TerreStar's licensed spectrum to spectrum bands dedicated to WMTS and (ii) technical and market conditions in the 1.4 GHz band, TerreStar concluded that its long-term wireless medical telemetry use of this spectrum will generate public interest benefits far greater than those from any other presently feasible use of this band. Accordingly, in April 2016, TerreStar informed WMTS interests that the company planned to abandon 802.16 WiMAX smart grid development and use its licensed spectrum for medical telemetry applications.

In coming to this decision, TerreStar recognized that wireless medical telemetry equipment can be deployed with relative efficiency in TerreStar's licensed 1.4 GHz spectrum in health care facilities and other environments. The adjacency of TerreStar's spectrum to the dedicated WMTS bands and the existing WMTS ecosystem at 1.4 GHz make wireless medical telemetry operations technically and operationally feasible in the commercial 1.4 GHz band. As designed and manufactured, many WMTS devices have front-end passband filters sufficiently wide that the equipment can operate on spectrum adjacent to the dedicated WMTS spectrum at 1395-1400 MHz and between 1427-1431.5 MHz. Once TerreStar and manufacturers complete the required equipment re-certification process, the active frequency range of devices in the field can be expanded to include TerreStar's licensed bands at 1390-1395 MHz and 1432-1435 MHz.¹²

In addition, given the flexibility of the Commission's Part 27 regulatory framework at 1.4 GHz, TerreStar notes that no rule changes are needed for TerreStar's deployment of wireless

¹² TerreStar estimates that it will take twelve to eighteen months to complete equipment re-certification for the critical mass of WMTS devices required for a comprehensive, national wireless medical telemetry roll-out in the commercial 1.4 GHz band. *See* Waiver Request at 27-28.

medical telemetry in its licensed spectrum.¹³ Low-power wireless medical telemetry systems and devices generally will comply with all applicable Part 27 technical rules in the 1.4 GHz band, and this equipment (after re-certification) will be able to operate in health care facilities at 1390-1392 MHz/1432-1435 MHz. While the Commission's emissions and field strength limits preclude the use of the 1392-1395 MHz band at health care facilities in order to protect WMTS systems above 1395 MHz from interference,¹⁴ this three megahertz band segment will be used for developmental and specialized medical telemetry applications outside of health care facilities. These developmental telemetry operations will include mobile medical telemetry in ambulances and other vehicles, medical telemetry at residences and nursing homes, rural telemedicine applications, and research and development operations at universities, medical schools, and corporate laboratories.

In order to implement wireless medical telemetry in the commercial 1.4 GHz band, TerreStar on August 12, 2016 submitted a request for a temporary, thirty-six month waiver of its April 23, 2017 substantial service deadline.¹⁵ ASHE, Philips Healthcare, and GE Healthcare all strongly support this request, and no parties have opposed a grant of this waiver.¹⁶ TerreStar

¹³ As discussed in these comments, however, TerreStar of course cannot implement wireless medical telemetry in the commercial 1.4 GHz band without grant of a temporary waiver of its substantial service requirements.

¹⁴ See 47 C.F.R. §§ 27.53, 27.804.

¹⁵ Under Section 27.14(a) of the Commission's rules, a commercial wireless licensee in the 1.4 GHz band must demonstrate that it is providing "service which is sound, favorable and substantially above a level of mediocre service which just might minimally warrant renewal," in order to show that it is providing substantial service. 47 C.F.R. § 27.14(a). The Commission has not adopted any substantial service "safe harbor" for 1.4 GHz band licensees, in contrast to its approach in the upper microwave bands and other commercial spectrum.

¹⁶ See WT Docket No. 16-290, Comments of GE Healthcare (Oct. 4, 2016); Letter from Delroy Smith, Philips Healthcare, to Marlene H. Dortch, FCC (Oct. 4, 2016); Reply Comments of Philips Healthcare (Oct. 14, 2016); Letter from Lawrence Movshin, Counsel to ASHE, to Amanda Huetinck, FCC (Nov. 10, 2016).

greatly appreciates the support of these parties, who have deep expertise on the medical telemetry ecosystems in the dedicated WMTS bands. TerreStar continues to work with equipment vendors and frequency coordinators in preparation for a robust implementation of wireless medical telemetry in its licensed spectrum.

IV. Grant of TerreStar's Waiver Request Will Generate Enormous Health Care Benefits

Grant of TerreStar's waiver request will enable it to use its licensed spectrum at 1.4 GHz for wireless medical telemetry applications in hospitals and other health care facilities and environments. This expansion of spectrum resources for wireless medical telemetry will deliver substantial public interest benefits by improving the quality of medical care for millions of patients throughout the country.

As described above, the development of wireless medical telemetry over the past thirty years has yielded enormous health care benefits. The reliability of these life-critical transmissions could be jeopardized in the coming years, however, by a shortage of spectrum for this service. Demand for remote patient monitoring in American hospitals and other health care facilities will likely continue to increase significantly over the next decade as the U.S. patient population ages and experiences frequent and acute medical problems.¹⁷ Health care providers will respond by deploying additional wireless medical telemetry devices within their facilities, potentially resulting in spectrum congestion and potentially disrupted transmissions. This interference threat is exacerbated by growing fears related to the operation of unlicensed devices in the 600 MHz band (where there is dedicated WMTS spectrum) and in the crowded 2.4 GHz ISM band; these concerns are likely to spur the migration of additional wireless medical telemetry to the 1.4 GHz band. Unfortunately, there is no identifiable source of additional,

¹⁷ In addition, the types of biometric data transmitted over wireless medical telemetry systems will expand with advances in medical technology, adding significantly more bandwidth demand per patient.

dedicated wireless medical telemetry spectrum that can be used to alleviate this spectrum shortage.

In the face of this increasing pressure on existing WMTS allocations, grant of TerreStar's waiver request is a ready pathway to ensuring the reliability and security of wireless medical telemetry operations. It is likely the last, best chance to add much-needed, long-term capacity for these life-critical systems. Grant of the Waiver Request will enable TerreStar to make available five additional megahertz of spectrum for wireless medical telemetry in hospitals and other health care facilities, an approximately 67% increase in capacity at 1.4 GHz. With this expanded capacity, hospitals and health care providers will avoid spectrum exhaustion and congestion while deploying telemetry devices more densely and utilizing new and innovative applications. The Commission should seize this unique opportunity to enhance the quality of medical care for millions of patients at hospitals and other health care facilities throughout the country.

The developmental use of TerreStar's licensed spectrum at 1392-1395 MHz for medical telemetry applications *outside* health care facilities will also yield substantial public interest benefits. Currently, there is no dedicated WMTS spectrum that is available for testing new medical telemetry applications. Using medical telemetry devices in mobile settings such as ambulances could produce significant improvements in emergency medical care. Medical telemetry in residences, nursing homes, and rehabilitation centers will provide significant benefits to health care patients, who increasingly rely on medical treatment in residential and other similar environments. In addition, research and development of wireless medical telemetry equipment – potentially as dedicated test sites for WMTS – promises to stimulate innovation and the development of new medical telemetry applications. Rural telemedicine applications could

benefit patients in rural and remote areas with the greatest need for improved medical care and treatment.

TerreStar is working cooperatively with equipment manufacturers, frequency coordinators, and health care industry representatives in order to ensure a long-term, robust implementation of wireless medical telemetry in its licensed spectrum. TerreStar is committed to using its spectrum during its license terms to maximize benefits for the health care community and millions of patients across the United States. These future public interest benefits strongly support a grant of TerreStar's waiver request.

V. Wireless Medical Telemetry Operations in TerreStar's Licensed Spectrum Will Be Largely Seamless for Hospitals, Health Care Providers, and Patients

TerreStar's use of its licensed spectrum for wireless medical telemetry will be largely seamless for hospitals, health care providers, and patients. These operations will occur in the commercial 1.4 GHz band under spectrum manager leasing arrangements,¹⁸ with lease terms ensuring long-term wireless medical telemetry use of this spectrum. TerreStar expects that Philips Healthcare, GE Healthcare, and other equipment manufacturers and vendors will in most instances be the spectrum manager lessees in these arrangements.¹⁹ This role is appropriate for medical telemetry equipment manufacturers, since it is the manufacturer that typically oversees the engineering, installation, and maintenance of wireless medical telemetry systems deployed at health care facilities. While hospitals and health care facilities will be free to enter into

¹⁸ These lease arrangements will be consistent with the criteria contained in Sections 1.9010 and 1.9020 of the Commission's rules. 47 C.F.R. §§ 1.9010, 1.9020.

¹⁹ TerreStar's spectrum manager lease arrangements will ensure that parties that invest in systems and devices and initiate wireless medical telemetry on TerreStar's licensed 1.4 GHz spectrum will be protected for the reasonable life of their equipment investment from any incompatible use of this spectrum.

individual spectrum manager lease arrangements directly with TerreStar, they will not *have* to do so to use medical telemetry systems operating in the commercial 1.4 GHz band.

TerreStar's spectrum manager leasing arrangements with equipment manufacturers and other entities will also be non-exclusive. TerreStar expects to enter into multiple spectrum manager leases covering the same frequencies and geographic areas, with the multiple lessees in those areas sharing that spectrum. As a result of this open leasing approach, TerreStar's spectrum manager lease arrangements with equipment manufacturers and vendors should collectively cover the populated geography of the United States, and generally extend for the useful life of the installed wireless medical telemetry equipment. Accordingly, health care facilities *everywhere* should be able to contract with vendors for the installation and secure, reliable use of wireless medical telemetry systems at 1.4 GHz, just as they do today in the dedicated WMTS bands.

Finally, as the licensee in this band, TerreStar will implement a national registration and frequency coordination framework similar to the procedures in place today in the dedicated WMTS bands. TerreStar hopes to contract with ASHE and Comsearch to establish and administer this wireless medical telemetry database and registration system in its commercial 1.4 GHz spectrum. Similar to the existing, dedicated WMTS spectrum at 1.4 GHz, health care providers and other spectrum lessees intending to operate wireless medical telemetry equipment in TerreStar's spectrum will be required to register their equipment in TerreStar's commercial 1.4 GHz database.²⁰ With respect to cost, beyond potential equipment expenses, health care entities will pay at most the registration and coordination fees associated with TerreStar's 1.4 GHz database. These fees will be determined by market forces and are likely to mirror the fees ASHE currently collects for registration and coordination in the dedicated WMTS bands.

²⁰ See Waiver Request at 19.

* * *

The extraordinary public interest benefits from TerreStar's use of its licensed 1.4 GHz spectrum for wireless medical telemetry operations are possible only with a grant of TerreStar's Waiver Request. Since this request was filed in August 2016, TerreStar has engaged in discussions with Commission staff regarding the timetable and method of measuring performance relating to the modification, testing, certification, and deployment of wireless medical telemetry equipment and devices operating at 1.4 GHz.²¹ TerreStar urges the Commission to grant the Waiver Request with the appropriate terms and conditions in order to bring enormous health care benefits to millions of patients treated at hospitals and other health care facilities around the country.

VI. Conclusion

TerreStar appreciates the Commission's strong commitment to improved health care. Grant of TerreStar's Waiver Request will advance the goals set forth in the *Health Care PN*. By enabling TerreStar to deploy wireless medical telemetry systems in its licensed 1.4 GHz spectrum, the Commission can protect and promote life-critical medical telemetry transmissions and enhance patient experiences and outcomes at health care facilities throughout the United States.

Respectfully submitted,

/s/ Regina M. Keeney

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May 24, 2017

²¹ Letter from Regina Keeney, Counsel to TerreStar Corporation, to Marlene Dortch, FCC, WT Docket No. 16-290 (Apr. 4, 2017).